



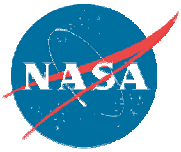
Transportation Strategic Roadmap Committee

Meeting #1

February 3-4, 2005



***Doug Cooke
Deputy Associate Administrator, Systems Integration
Exploration Systems Mission Directorate***



The Vision for Space Exploration



THE FUNDAMENTAL GOAL OF THIS VISION IS TO ADVANCE U.S. SCIENTIFIC, SECURITY, AND ECONOMIC INTEREST THROUGH A ROBUST SPACE EXPLORATION PROGRAM

A RENEWED SPIRIT OF DISCOVERY

*The President's Vision for
U.S. Space Exploration*



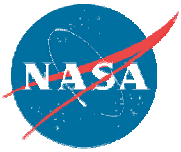
PRESIDENT GEORGE W. BUSH
JANUARY 2004

Implement a sustained and affordable human and robotic program to explore the solar system and beyond

Extend human presence across the solar system, starting with a human return to the Moon by the year 2020, in preparation for human exploration of Mars and other destinations;

Develop the innovative technologies, knowledge, and infrastructures both to explore and to support decisions about the destinations for human exploration; and

Promote international and commercial participation in exploration to further U.S. scientific, security, and economic interests.



Realizing the Future

Earth, Moon, Mars, and Beyond



Foster and sustain the exploration culture across generations

- ◆ Open new frontiers
- ◆ Continuing and inspiring
- ◆ A constant impetus to educate and train

Identify, develop, and apply advanced technologies to...

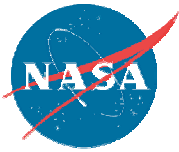
- ◆ Enable exploration and discovery
- ◆ Allow the public to actively participate in the journey
- ◆ Translate the benefits of these technologies to improve life on Earth

Harness the brain power

- ◆ Engage the nation's science and engineering assets
- ◆ Motivate successive generations of students to pursue science, math, engineering and technology
- ◆ Create the tools to facilitate broad national technical participation

International Cooperation

- ◆ Promote common objectives and cooperative/complementary efforts for space exploration
- ◆ Utilize international capabilities to help close capability gaps and develop breakthrough technologies

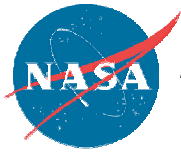


Vision for Space Exploration

Key Presidential Direction



1. Return the Shuttle to safe flight as soon as practical, based on CAIB recommendations
2. Use Shuttle to complete ISS assembly
3. Retire the Shuttle after assembly complete (2010 target)
4. Focus ISS research to support exploration goals; understanding space environment and countermeasures
5. Meet foreign commitments
6. Undertake lunar exploration to support sustained human and robotic exploration of Mars and beyond
7. Series of robotic missions to Moon by 2008 to prepare for human exploration
8. Expedition to lunar surface as early as 2015 but no later than 2020
9. Use lunar activities to further science, and test approaches (including lunar resources) for exploration to Mars & beyond
10. Conduct robotic exploration of Mars to prepare for future expedition
11. Conduct robotic exploration across solar system to search for life, understand history of universe, search for resources
12. Conduct advanced telescope searches for habitable environments around other stars
13. Demonstrate power, propulsion, life support capabilities for long duration, more distant human and robotic missions
14. Conduct human expeditions to Mars after acquiring adequate knowledge and capability demonstrations
15. **Develop a new Crew Exploration Vehicle; flight test before end of decade; human exploration capability by 2014**
16. **Separate cargo from crew as soon as practical to support ISS; acquire crew transport to ISS after Shuttle retirement**
17. Pursue international participation
18. **Pursue commercial opportunity for transportation and other services**



Exploration Systems Implementation

Key Objectives & Milestones

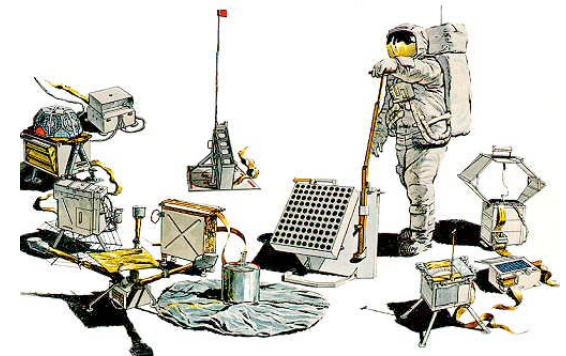


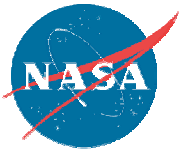
◆ Objectives

- □ Implement a sustained and affordable human and robotic program
- □ Extend human presence across the solar system and beyond
- □ Develop supporting innovative technologies, knowledge, and infrastructures
- □ Promote international and commercial participation in exploration

◆ Major Milestones

- □ 2008: Initial flight test of CEV
- □ 2008: Launch first lunar robotic orbiter
- □ 2009-2010: Robotic mission to lunar surface
- □ 2011: First uncrewed CEV flight
- □ 2014: First crewed CEV flight
- □ 2015–2020: First human mission to the Moon





Implementing the Vision for Space Exploration...

One Step at a Time

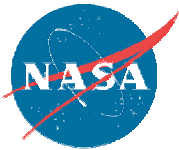


New Way of Doing Business Enables Affordability & Sustainability

- ◆ Spiral Development employs technology to enable each successive step
 - [] Focused on System-of-Systems needed for Exploration
 - [] Paced by experience, technology readiness and flexibility
- ◆ Implement Strategy-to-Task-to-Technology Process
 - [] Requirements-driven technology investment
- ◆ Employ innovative acquisition strategies
 - [] Commercial Service Providers, Data buys
 - [] Government/industry partnerships
 - [] International participation
- ◆ Rigorous acquisition strategy and execution
 - [] Management rigor
 - [] Consistency of purpose
 - [] Disciplined processes

Use the Vision to Transform NASA

- ◆ Focus Agency on a long term space vision
- ◆ Employ an integrated agency approach
- ◆ Leverage talent, experience and leadership – recent successes and demonstrated management reforms
- ◆ Maintain passion and commitment to succeed

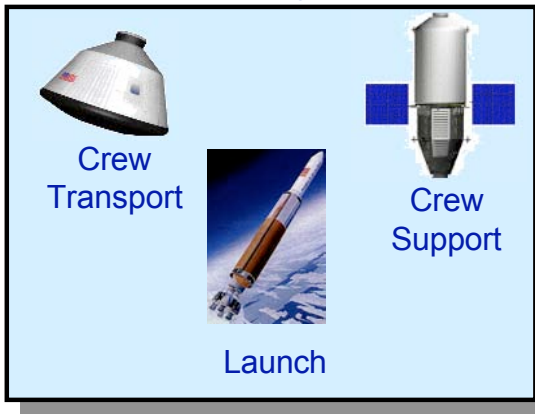


Vision Requires System-of-Systems Integration

Cross-Agency Coordination & Integration



Transit and Launch Systems



The Human: an Essential Element of the System of Systems



Surface and Orbital Systems

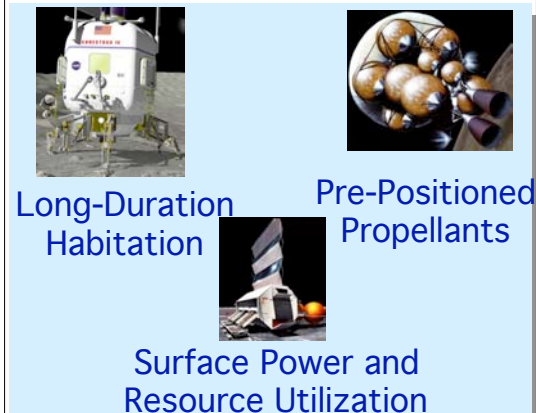


Biomedical Countermeasures and Limits



Resource Identification and Characterization

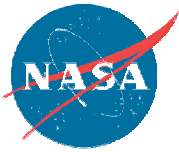
Supporting Research



Technology Options

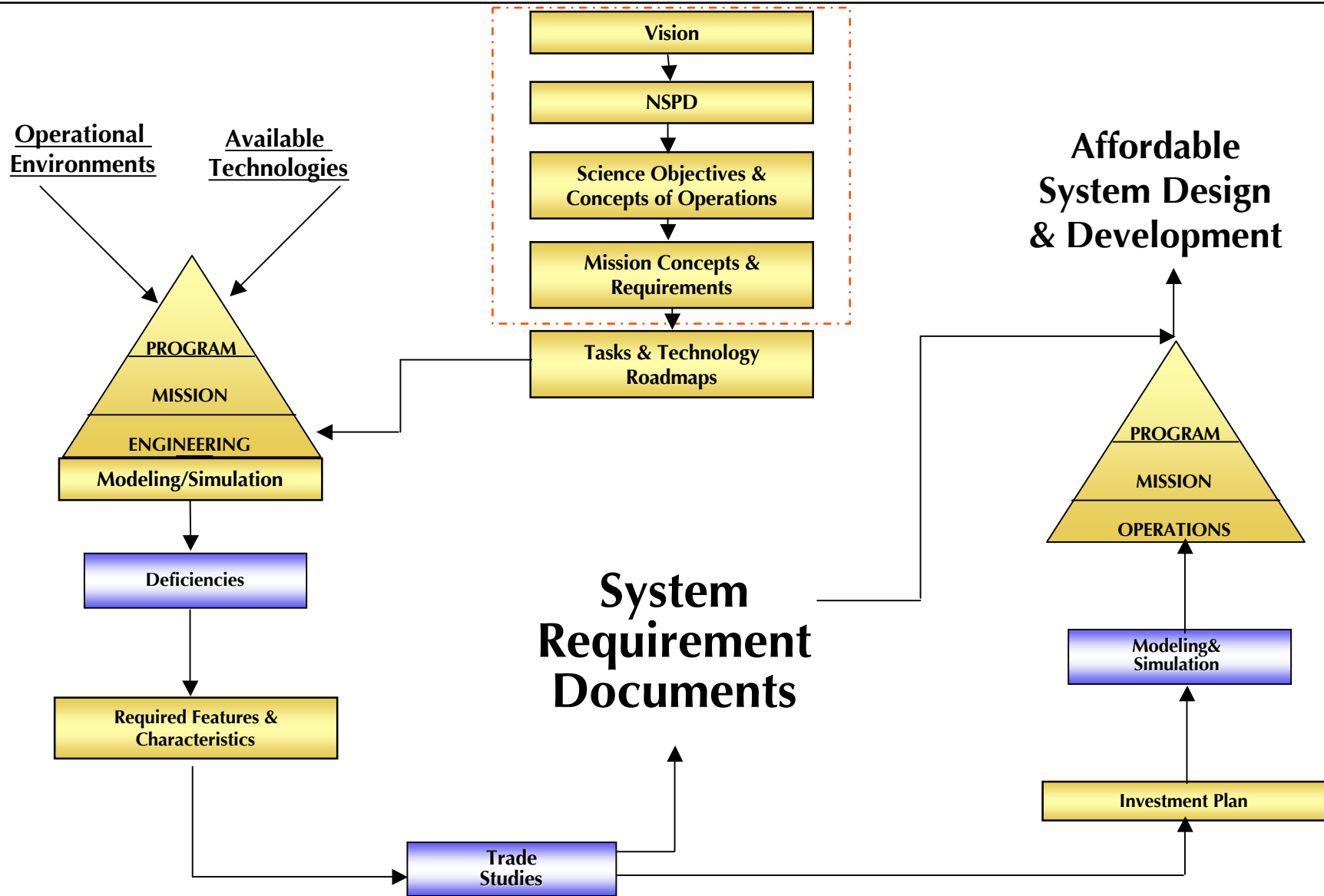


Commonality/Evolvability For Future Missions



Developing Requirements and an Investment Plan

Strategy-to-Task-to-Technology Process





*We're not where we want to be,
We're not where we're going to be,
BUT we're certainly not where we
were yesterday.*

